

Application No. 10/064,129
 Amendment dated October 31, 2006
 Reply to Office Action of August 10, 2005

RD-28679-1

Listing of Claims:

1-8. (canceled)

9. (currently amended) A phosphor blend comprising $(\text{Tb}, \text{Lu}, \text{La}, \text{Gd})_x(\text{Al}, \text{Ga})_y\text{O}_{12}:\text{Ce}^{3+}$ or $(\text{Tb}, \text{Y}, \text{Lu}, \text{La}, \text{Gd})_x\text{Ga}_y\text{O}_{12}:\text{Ce}^{3+}$, wherein x is in a range from about 2.8 to and including 3 and y is a range from about 4 to and including 5, and at least another phosphor selected from one of groups: (a) $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F}, \text{OH}):\text{Eu}^{2+}$, $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5:\text{Eu}^{2+}$; (b) ~~$\text{BaAl}_2\text{O}_4:\text{Eu}^{2+}$, BaTiP_2O_8 , and $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH}):\text{Sb}^{3+}$~~ ; (c) ~~$\text{CeMgAl}_{11}\text{O}_{19}:\text{Tb}^{3+}$ and $\text{GdMgB}_5\text{O}_{10}:\text{Tb}^{3+}$~~ ; and (d) $(\text{Gd}, \text{La}, \text{Lu}, \text{Sc})_2\text{O}_3:\text{Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La}, \text{In}, \text{Lu}, \text{Sc})\text{BO}_3:\text{Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La})(\text{Al}, \text{Ga})\text{O}_3:\text{Eu}^{3+}$, $(\text{Ba}, \text{Sr}, \text{Ca})(\text{Y}, \text{Gd}, \text{La}, \text{Lu})_2\text{O}_4:\text{Eu}^{3+}$, $(\text{Y}, \text{Gd})\text{Al}_3\text{B}_4\text{O}_{12}:\text{Eu}^{3+}$, $(\text{Gd}, \text{Y})_4(\text{Al}, \text{Ga})_2\text{O}_9:\text{Eu}^{3+}$, and $(\text{Ca}, \text{Sr})(\text{Gd}, \text{Y})_3(\text{Ge}, \text{Si})\text{Al}_3\text{O}_9:\text{Eu}^{3+}$; and ~~$(\text{Sr}, \text{Mg})_3(\text{PO}_4)_2:\text{Sn}^{2+}$~~ wherein said phosphor blend is capable of absorbing EM radiation having wavelengths in a range from about 200 nm to about 400 nm and emitting light in having wavelengths in a visible spectrum.

10. (canceled)

11. (currently amended) The phosphor blend of claim 9, wherein said phosphor blend absorbs EM radiation substantially in a wavelength range from about 250 nm to about 300 nm.

12. (original) The phosphor blend of claim 11, wherein said white light has color coordinates substantially on a black body locus of a CIE chromaticity diagram.

13. (original) The phosphor blend of claim 11, wherein said color coordinates of said white light is represented by a point at a distance less than or equal to about 0.0054 from a black body locus of a CIE chromaticity diagram.

14. (original) The phosphor blend of claim 9, wherein said light emitted from said phosphor blend is white light.

Application No. 10/064,129
 Amendment dated October 31, 2006
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RD-28679-1

15. (original) The phosphor blend of claim 9, wherein y is in a range from about 4.5 to and including 5.

16. (original) The phosphor blend of claim 9, wherein y is in a range from about 4.6 to and including 5.

17. (currently amended) A phosphor blend comprising a plurality of phosphors, each of said phosphors being selected from one of groups: (a) $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F})\text{:Eu}^{2+}$, $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5\text{:Eu}^{2+}$; (b) $\text{BaAl}_8\text{O}_{13}\text{:Eu}^{2+}$, BaTiP_2O_8 , and $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH})\text{:Sb}^{3+}$; (c) $(\text{Tb}, \text{Lu}, \text{La}, \text{Gd})_x(\text{Al}, \text{Ga})_y\text{O}_{12}\text{:Ce}^{3+}$ or $(\text{Tb}, \text{Y}, \text{Lu}, \text{La}, \text{Gd})_x\text{Ga}_y\text{O}_{12}\text{:Ce}^{3+}$, wherein x is a range from about 2.8 to and including 3 and y is in a range from about 4 to and including 5, $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F}, \text{OH})\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH})\text{:Mn}^{2+}, \text{Sb}^{3+}$; and (d) $(\text{La}, \text{Lu}, \text{Sc})_2\text{O}_3\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La}, \text{In}, \text{Lu}, \text{Sc})\text{BO}_3\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La})(\text{Al}, \text{Ga})\text{O}_3\text{:Eu}^{3+}$, $(\text{Ba}, \text{Sr}, \text{Ca})(\text{Y}, \text{Gd}, \text{La}, \text{Lu})_2\text{O}_4\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd})\text{Al}_3\text{B}_4\text{O}_{12}\text{:Eu}^{3+}$, $(\text{Gd}, \text{Y})_4(\text{Al}, \text{Ga})_2\text{O}_9\text{:Eu}^{3+}$, $(\text{Ca}, \text{Sr})(\text{Gd}, \text{Y})_3(\text{Ge}, \text{Si})\text{Al}_3\text{O}_9\text{:Eu}^{3+}$, $(\text{Sr}, \text{Mg})_3(\text{PO}_4)_2\text{:Sm}^{2+}$, and $\text{GdMgB}_5\text{O}_{10}\text{:Ce}^{3+}, \text{Mn}^{2+}$; wherein y is in a range from about 4.5 to and including 5, at least two of said phosphors are selected from different groups, and said phosphor blend is capable of absorbing EM radiation having wavelengths in a range from about 200 nm to about 400 nm and emitting light in having wavelengths in a visible spectrum.

18. (canceled)

19. (original) The phosphor blend of claim 17, wherein y is in a range from about 4.6 to and including 5.

20-23. (canceled)

24. (currently amended) A phosphor blend comprising phosphors each of said phosphors being selected from one of groups: (a) $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F}, \text{OH})\text{:Eu}^{2+}$, $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5\text{:Eu}^{2+}$; (b) $\text{CeMgAl}_{11}\text{O}_{19}\text{:Tb}^{3+}$, and $\text{GdMgB}_5\text{O}_{10}\text{:Tb}^{3+}$; (c) $(\text{Tb}, \text{Lu}, \text{La}, \text{Gd})_x(\text{Al}, \text{Ga})_y\text{O}_{12}\text{:Ce}^{3+}$, $(\text{Tb}, \text{Y}, \text{Lu}, \text{La}, \text{Gd})_x\text{Ga}_y\text{O}_{12}\text{:Ce}^{3+}$,

Application No. 10/064,129
 Amendment dated October 31, 2006
 Reply to Office Action of August 10, 2005

RD-28679-1

(Ba,Sr,Ca)₅(PO₄)₃(F,OH):Eu²⁺, and ~~(Ba,Sr,Ca)₅(PO₄)₃(Cl,F,OH):Mn²⁺, Sb³⁺~~; and (d) (La,Lu, Sc)₂O₃:Eu³⁺, (Y,Gd,La,In,Lu,Sc)BO₃:Eu³⁺, (Y,Gd,La)(Al,Ga)O₃:Eu³⁺, (Ba,Sr,Ca)(Y,Gd,La,Lu)₂O₄:Eu³⁺, (Y,Gd)Al₃B₄O₁₂:Eu³⁺, (Gd,Y)₄(Al,Ga)₂O₉:Eu³⁺, and (Ca,Sr)(Gd,Y)₃(Ge,Si)Al₃O₉:Eu³⁺, ~~and (Sr,Mg)₃(PO₄)₂:Sn²⁺~~; wherein x is in a range from about 2.8 to and including 3, y is in a range from about 4 to and including 5, at least two phosphors are selected from different groups, and said phosphor blend is capable of absorbing EM radiation having wavelengths in a range from about 200 nm to about 400 nm and emitting light having wavelengths in a visible spectrum.

25. (previously presented) The phosphor blend of claim 24, wherein y is in a range from about 4.6 to and including 5.

26-28. (canceled)

29. (currently amended) A phosphor blend comprising phosphors, each of said phosphors being selected from one of groups: (a) (Ba,Sr,Ca)₅(PO₄)₃(F):Eu²⁺, ~~(Ba,Sr,Ca)MgAl₁₀O₁₇:Eu²⁺~~, and (Ba,Sr,Ca)BPO₅:Eu²⁺; and (b) (Tb,Y,Lu,La,Gd)_x(Al,Ga)_yO₁₂:Ce³⁺ and (Ba,Sr,Ca)₅(PO₄)₃(Cl,F,OH):Eu²⁺, Mn²⁺, Sb³⁺; wherein x is in a range from about 2.8 to and including 3, y is in a range from about 4 to and including 5, at least two phosphors are selected from different groups, and said phosphor blend is capable of absorbing EM radiation having wavelengths in a range from about 200 nm to about 400 nm and emitting light in having wavelengths in a visible spectrum.

30. (currently amended) A phosphor blend comprising phosphors, each of said phosphors being selected from one of groups: (a) (Ba,Sr,Ca)₅(PO₄)₃(F,OH):Eu²⁺, ~~(Ba,Sr,Ca)MgAl₁₀O₁₇:Eu²⁺~~, and (Ba,Sr,Ca)BPO₅:Eu²⁺; and (b) (Tb,Lu,La,Gd)_x(Al,Ga)_yO₁₂:Ce³⁺, (Tb,Y,Lu,La,Gd)_xGa_yO₁₂:Ce³⁺, (Ba,Sr,Ca)₅(PO₄)₃(F,OH):Eu²⁺ and ~~(Ba,Sr,Ca)₅(PO₄)₃(Cl,F,OH):Mn²⁺, Sb³⁺~~;[[;]] wherein x is in a range from about 2.8 to and including 3, y is in a range from about 4 to and including 5, at least two phosphors are selected from different groups, and said phosphor

Application No. 10/064,129
 Amendment dated October 31, 2006
 Reply to Office Action of August 10, 2005

RD-28679-1

blend is capable of absorbing EM radiation having wavelengths in a range from about 200 nm to about 400 nm and emitting light in having wavelengths in a visible spectrum.

31. (previously presented) The phosphor blend of claim 30, wherein y is in a range from about 4.6 to and including 5.

32. (canceled)

33. (currently amended) A light source comprising:

(a) a source of gas discharge; and

(b) a phosphor blend comprising at least two phosphors, each of said phosphors being selected from one of groups: (1) $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F}, \text{OH})\text{:Eu}^{2+}$, $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5\text{:Eu}^{2+}$; (2) ~~$\text{BaAl}_8\text{O}_{13}\text{:Eu}^{2+}$~~ , BaTiP_2O_8 , $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}\text{:Eu}^{2+}$, Mn^{2+} , and $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH})\text{:Sb}^{3+}$; (3) ~~$\text{CeMgAl}_{11}\text{O}_{19}\text{:Tb}^{3+}$~~ , and $\text{GdMgB}_5\text{O}_{10}\text{:Tb}^{3+}$; (4) $(\text{Tb}, \text{Lu}, \text{La}, \text{Gd})_x(\text{Al}, \text{Ga})_y\text{O}_{12}\text{:Ce}^{3+}$, $(\text{Tb}, \text{Y}, \text{Lu}, \text{La}, \text{Gd})_x\text{Ga}_y\text{O}_{12}\text{:Ce}^{3+}$, $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F}, \text{OH})\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH})\text{:Mn}^{2+}$, Sb^{3+} ; and (5) $(\text{Y}, \text{Gd}, \text{La}, \text{Lu}, \text{Sc})_2\text{O}_3\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La}, \text{In}, \text{Lu}, \text{Sc})\text{BO}_3\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La})(\text{Al}, \text{Ga})\text{O}_3\text{:Eu}^{3+}$, $(\text{Ba}, \text{Sr}, \text{Ca})(\text{Y}, \text{Gd}, \text{La}, \text{Lu})_2\text{O}_4\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd})\text{Al}_3\text{B}_4\text{O}_{12}\text{:Eu}^{3+}$, $(\text{Gd}, \text{Y})_4(\text{Al}, \text{Ga})_2\text{O}_9\text{:Eu}^{3+}$, and $(\text{Ca}, \text{Sr})(\text{Gd}, \text{Y})_3(\text{Ge}, \text{Si})\text{Al}_3\text{O}_9\text{:Eu}^{3+}$, ~~and $(\text{Sr}, \text{Mg})_3(\text{PO}_4)_2\text{:Sn}^{2+}$~~ ; wherein x is in a range from about 2.8 to and including 3, y is in a range from about 4 to and including 5, at least two phosphors are selected from different groups, and said phosphor blend is capable of absorbing EM radiation that is emitted by said source of gas discharge and has wavelengths in a range from about 200 nm to about 400 nm and emitting light in having wavelengths in a visible spectrum.

34. (previously presented) The light source of claim 33, wherein y is in a range from about 4.6 to and including 5.

35-52. (canceled)

Application No. 10/064,129
 Amendment dated October 31, 2006
 Reply to Office Action of August 10, 2005

RD-28679-1

53. (previously presented) A light source comprising:

(a) a source of gas discharge; and

(b) phosphor blend comprising phosphors, each of said phosphors being selected from one of groups: (1) $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{OH})\text{:Eu}^{2+}$, $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5\text{:Eu}^{2+}$; (2) $(\text{Tb}, \text{Lu}, \text{La}, \text{Gd})_x(\text{Al}, \text{Ga})_y\text{O}_{12}\text{:Ce}^{3+}$, $(\text{Tb}, \text{Y}, \text{Lu}, \text{La}, \text{Gd})_x\text{Ga}_y\text{O}_{12}\text{:Ce}^{3+}$, $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{F}, \text{OH})\text{:Eu}^{2+}$, and $(\text{Ba}, \text{Sr}, \text{Ca})_3(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH})\text{:Mn}^{2+}$, Sb^{3+} ; and (3) $(\text{La}, \text{Lu}, \text{Sc})_2\text{O}_3\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La}, \text{In}, \text{Lu}, \text{Sc})\text{BO}_3\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd}, \text{La})(\text{Al}, \text{Ga})\text{O}_3\text{:Eu}^{3+}$, $(\text{Ba}, \text{Sr}, \text{Ca})(\text{Y}, \text{Gd}, \text{La}, \text{Lu})_2\text{O}_4\text{:Eu}^{3+}$, $(\text{Y}, \text{Gd})\text{Al}_3\text{B}_4\text{O}_{12}\text{:Eu}^{3+}$, $(\text{Gd}, \text{Y})_4(\text{Al}, \text{Ga})_2\text{O}_9\text{:Eu}^{3+}$, and $(\text{Ca}, \text{Sr})(\text{Gd}, \text{Y})_3(\text{Ge}, \text{Si})\text{Al}_3\text{O}_9\text{:Eu}^{3+}$, ~~and $(\text{Sr}, \text{Mg})_3(\text{PO}_4)_2\text{:Sn}^{2+}$~~ ; wherein x is in a range from about 2.8 to and including 3, y is in a range from about 4 to and including 5, at least two phosphors are selected from different groups, and said phosphor blend is capable of absorbing EM radiation having wavelengths in a range from about 200 nm to about 400 nm and emitting light in having wavelengths in a visible spectrum.

54. (previously presented) The light source of claim 53, wherein y is in a range from about 4.6 to and including 5.

55-84. (canceled)